

# MECHATRONIC APPROACH FOR DESIGN AND CONTROL OF A HYDRAULIC 3-DOF PARALLEL ROBOT

HANCU, O.; MATIES, V.; BALAN, R.; STAN, S. & LAPUSAN, C.

**Abstract:** *Modern machine tools based on parallel kinematic architecture provide excellent performance in terms of stiffness/weight ratio. Also, hydraulic actuators are widely used in industrial applications due to several advantages like large force and torque, high power to weight ratio, rapid response. The current paper presents the mechatronic design of a translational 3-DOF parallel robot which uses three hydraulic actuators to control the motion of the end-effector. The mechatronic approach in the design of products allows optimal design and also a global analysis of the system in terms of precision and efficiency. An optimal control strategy based on a multipoint linearization method is proposed and tested. An integrated simulation method is detailed and used to simulate and analyze the behavior of the whole system. Both simulation and experimental results are provided to show the effectiveness of the models and proposed control method.*

**Key words:** *mechatronics, servo hydraulic, simulation, motion control*



**Authors' data:** Ph.D. Hancu, O[limpiu]; Ph.D. Maties, V[istrian]; Ph.D. Balan, R[adu]; Ph.D. Stan, S[ergiu]; Ph.D. Lapusan, C[iprian], T Technical University of Cluj-Napoca, B-dul Muncii, No.105, 400641 Cluj-Napoca, Romania, Olimpiu.Hancu@mmfm.utcluj.ro, Vistrian.Maties@mmfm.utcluj.ro, radubalan@mmfm.utcluj.ro, sergiustan@ieee.org, lapusanciprian@yahoo.com

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